Valley Water

2019 Environmental Stewardship Update

Pictured:
Ridgway's Rail

Photo Credit:
Judy Irving, Pelican Media

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Message from the CEO

The year 2019 marks the 20th anniversary of the board of directors' landmark decision to formally include environmental stewardship as part of Santa Clara Valley Water District's (Valley Water's) basic mission. By adopting policies to improve watersheds, streams and natural resources; protect water quality; restore salmonid habitat; and provide access to trails and open space, Valley Water has acknowledged its role as caretaker of our fragile environment.

Today, Valley Water's environmental stewardship work is extensive, with many broad-scale efforts underway. These efforts are funded through various sources, including the voter-approved Safe, Clean Water and Natural Flood Protection Program. Valley Water is also working on the One Water Plan, Valley Water's first long-term, watershed-scale effort to integrate water supply, flood protection and stream stewardship objectives. By approaching water resources planning holistically, Valley Water ensures that the three arms of its mission are balanced in the years to come.

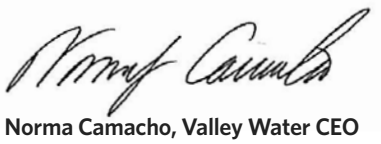
Similarly, development of the Climate Change Action Plan is well underway, with staff working together across all divisions to develop strategies to adapt to sea-level rise, as well as to less-predictable effects of increased global temperatures. Valley Water is on track to be carbon-neutral by 2020 as a result of various initiatives including water conservation, operational improvements, such as the installation of efficient pumps in treatment plants, and use of renewable energy.

Furthermore, stewardship goals are considered early in the capital project delivery process and guide Valley Water's maintenance operations. Complementing these organization-wide efforts are individual stewardship projects focused on monitoring, protecting and enhancing watershed functions, wetland, riparian and aquatic habitat and restoring historic steelhead runs. Projects to promote water quality awareness, reduce pollutants in streams, encourage new innovative water conservation programs and technologies and support additional trails and open space have also been completed.

Finally, Valley Water partners with agencies to advance environmental stewardship. The South San Francisco Bay Shoreline Project, the first Bay Area project to combine coastal flood protection with wetland restoration, received a significant boost in 2018 with the federal government awarding it $177.2 million in disaster supplemental funding. The project is also the first to include protection for rising seas.

This report highlights the policies and programs Valley Water carries out to support healthy watersheds and environmental stewardship. It also presents a list of stewardship projects that were completed since the last such Valley Water report in 2015. I hope you will join me in celebrating these outstanding accomplishments with our community.

Sincerely,



Norma Camacho, Valley Water CEO

Valley Water is on track to be
carbon-neutral by 2020.

Arroyo Aguague Creek

Environmental Stewardship Policies and Programs

Valley Water is committed to protecting our environment and is working to restore habitat along the creeks and the bay, clean toxins from water and make sure water is used efficiently throughout our community. For a greater and a more impactful and sustainable outcome, Valley Water has leveraged resources through strategic partnerships with the community, other agencies, not-for-profit organizations, businesses and volunteers.

Photo Credit: Judy Irving, Pelican Media

Salt marsh harvest mouse

South Bay Salt Ponds Restoration Project will restore

15,100

acres of industrial salt ponds.

Leading the Way with Progressive Policies

Over the years, Valley Water board has instituted several progressive policies that ensure that environmental stewardship is woven into all the work we do. In 2018, the board adopted a new policy to support environmental justice for disadvantaged communities.

In the Environmental Justice Values Statement adopted in February 2018, the board stated: "We are committed to upholding Environmental Justice for Disadvantaged Communities in Santa Clara County (low-income, minority, immigrant, tribal, or Limited English Proficiency residents), and will strive to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to our projects and programs."

An example of the early implementation of this new policy is the grants program, which is funded through the voter-approved Safe, Clean Water and Natural Flood Protection Program (Safe, Clean Water Program). Valley Water is in the process of formally updating the evaluation criteria to expand the impact of grant funding in Disadvantaged Communities.

Later in the year, the board also selected a new logo and a tagline to represent better Valley Water's three-pronged mission of providing clean water, a healthy environment and flood protection.

Valley Water board has established board advisory committees, such as the Environmental and Water Resources Committee and the Water Conservation and Demand Management Committee, to engage stakeholders and the general public in policy development. These committees assist in developing and recommending policies and providing the board feedback on Valley Water efforts towards implementing its mission. Additionally, an independent monitoring committee provides fiscal oversight and accountability over the Safe, Clean Water Program. The public is encouraged to participate in advisory committee meetings, which are publicly noticed, and also serve on some of these committees.

For more details, visit **https://www.valleywater.org/how-we-operate/committees/board-advisory-committees**.

Protecting and Restoring Streams, Wetland, Bay and Watershed Lands

Valley Water carries out extensive efforts to enhance, protect and restore watershed functions, wetlands, riparian and aquatic habitat and restore historic steelhead runs. These efforts provide countywide benefits and some of these programs are detailed below.

Pictured:
Tide gates at Pond A8 were fully opened in 2017.

South Bay Salt Ponds Restoration Project (SBSPRP), the largest environmental restoration project on the West Coast, will restore 15,100 acres of industrial salt ponds to a rich mosaic of tidal wetlands and other natural habitats.

A total of 1,600 acres of tidal marsh have been restored, 2,150 acres of ponds reconfigured to better support pond species and seven miles of trails created under Phase 1 of the project, which was completed in 2016. Valley Water participation, including construction of project elements, providing $2.6 million in funding for scientific support and serving on the Technical Advisory Committee and the Project Management Team, is critical to the success of the project.

In 2006, Valley Water completed restoration of approximately 500 acres of former salt ponds to tidal marsh. Referred to as the "Island Ponds," this was one of the first elements of the SBSPRP to be completed. The success of the Island Ponds restoration has exceeded all expectations, with endangered species returning to the newly established marsh. In 2011, Valley Water completed construction of a new tide gate structure in Pond A8 near Alviso, connecting 1,400 acres of salt pond complex to the Bay, creating new marsh and shallow water habitats for birds such as pelicans. The structure, which contains eight five-foot wide gates, was fully opened in June 2017.

Construction work on Phase 2 to restore a combined total of 2,400 acres of ponds in the Alviso area (Ponds A5 to A8) in San José, and Mountain View area (Ponds A1 and A2W) and the Ravenswood area near East Palo Alto/Menlo Park began in mid-2018. In this phase, Valley Water will provide the sediment to build gently sloping transition zones, or ecotones, in the Alviso area. Valley Water obtains the sediment through regular sediment removal from local streams to maintain their flood conveyance capacity. Once the ecotone is ready for planting, San Francisco Bay Bird Observatory, under the partnership with Valley Water, will plant marsh vegetation. Adding this feature will not only benefit the recovery of wetland species and restore lost ecological function, but its tall dense vegetation will also slow storm surges while keeping up with rising sea level to provide resilient flood protection. Salt ponds restoration efforts for Ponds A9 to A15 are being carried out under the South San Francisco Bay Shoreline Study, which is the first study of its kind in the Bay Area to develop a definitive plan to provide flood risk management in light of the sea-level rise in the Bay. (*For more information on this project see the South San Francisco Bay Shoreline Project on page 33.*)

The SBSPRP is led by the California State Coastal Conservancy, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW). Besides Valley Water, other project partners include the U.S. Army Corps of Engineers (USACE), the U.S. Geological Survey, and neighboring cities such as Mountain View, Menlo Park, San Jose/Alviso, and others.

Photo Credit:
Julie Kitzenberger

Best of the Best

In June 2018, Friends of the San Francisco Estuary presented an award to Valley Water Board of Directors for the water district's partnership role in the South Bay Salt Pond Restoration Project. Mitch Avalon, President of the Friends of the San Francisco Estuary Board, described Valley Water as the "best of the best."

Pathogen-Free Planting

In 2015, a year after the discovery of revegetation sites infected with non-native, soil-borne pathogens Phytophthora, Valley Water established a plant pathogen program and is now steering the effort to reduce the introduction and spread of this deadly plant killer. These plant pathogens spread in contaminated soil from infected container plants, muddy tools, vehicles and equipment. Once introduced to a site, these pathogens can cause significant plant mortality and failure of mitigation sites, and spread to adjacent habitats. Treatment and remediation can be time-consuming and expensive and is sometimes not possible.

From 2015 to 2017, Valley Water conducted a comprehensive study of its mitigation sites to determine the extent of the problem, created a set of maps outlining sensitive sites and known contaminated sites located on its facilities and provided guidance on activities in these areas.

All watershed capital projects currently in construction and all water utility capital and operations projects in biologically sensitive areas now follow best practices and guidance developed by the Phytophthoras in Native Habitats Work Group. Valley Water is also active in various regional and statewide working groups, including Phytophthoras in Native Habitats Work Group, California Oak Mortality Task Force and California Native Plant Society (CNPS) Ad Hoc Committee on Phytophthoras.

In 2018, Valley Water successfully remediated Phytophthora plant pathogens from the Coyote Ceanothus Mitigation Project site. Healthy seedlings grown using phytosanitary procedures are doing well at the site and will contribute to the creation of a new population of this endangered shrub.

Pictured:
Pathogen-Free Planting

Valley Water's Stream and Watershed Protection Program has preserved nearly

3,600

acres of upper watershed streams.

Trash boom cleaning

Pollution Prevention

Storm drains carry water and pollutants like sediment, motor oil, pesticides and trash directly to our local streams and the bay. Cities, counties and flood protection districts are required to keep stormwater clean by preventing pollution and ensuring that only rain goes down the storm drain.

In December 2016, the state awarded Valley Water a grant to develop a Stormwater Resource Plan for the Santa Clara Basin which will prioritize projects that allow rainwater to infiltrate into vegetated areas rather than going down a drain. These projects also increase groundwater supplies, reduce peak flows and erosion and provide many other community benefits. Other Valley Water programs include trash monitoring, managing trash-capturing booms and cleaning designated hot spots.

Stream and Watershed Protection Program

Valley Water's Stream and Watershed Protection Program (SWPP) has preserved nearly 3,600 acres of upper watershed streams and the buffer lands surrounding them. In partnerships with open space agencies, seven properties were acquired and preserved between 2004 and 2015. Portions of the SWPP land provided mitigation for projects including the original Stream Maintenance Program. However, several hundred acres were also preserved above and beyond what was required for mitigation, providing opportunities for proactive stewardship projects as well as future mitigation opportunities.

Through this program, Valley Water not only preserves watershed lands but protects and enhances their conservation value. Sensitive habitats that are protected as part of the SWPP include regionally limited aquatic habitat (seasonal and perennial streams, springs, wetlands, and stock ponds),

Watershed Protection: Coyote Ceanothus

blue and valley oak woodland, riparian forest and serpentine grassland and chaparral. These habitats support rich wildlife communities, including important populations of special-status species such as Bay checkerspot butterfly, California red-legged frog and California tiger salamander. Special-status plants including Coyote ceanothus, Tiburon paintbrush and Santa Clara Valley dudleya, among others, are also protected on these lands.

Finally, SWPP lands provide ecological connectivity for wide-ranging wildlife, such as mountain lion. Valley Water is committed to managing SWPP lands in perpetuity to preserve the many and varied conservation values these provide.

In 2018, the Midpeninsula Regional Open Space District completed the Hendry's Creek Restoration Project using Valley Water grant funding. Earlier, in 2015, Valley Water had provided 117-acre SWPP property for the project that brought about the removal and remediation of dilapidated stream crossings enhancing the habitat for a variety of common and special-status wildlife. During project construction, a new population of California giant salamanders was documented.

Restoring Historic Steelhead Runs

In 2018, Valley Water completed the Study of Santa Clara County Steelhead Streams to Identify Priority Locations for Gravel Augmentation and Large Woody Debris Placement. Funded by the Safe, Clean Water Program, this study developed gravel placement site prioritization criteria, large woody debris (LWD) placement site prioritization criteria and identification of 20 appropriate project sites.

Considerations used to guide site prioritization and feasibility include hydraulic assessments and evaluation of sediment transport, channel stability evaluation including channel history and projected watershed and channel conditions, channel habitat type and desired channel habitat and stream access for implementation and maintenance, potential gravel and wood source and volume of placement materials.

In 2018, gravel and LWD augmentation projects were implemented at Stevens Creek in Cupertino and Alamitos Creek in San José under Valley Water's Stream Maintenance Program *(see Stream Stewardship Project section on page 18).* Concepts were developed for the remaining 18 priority sites.

Valley Water identifies

20

gravel and large woody debris augmentation sites to help steelhead spawning and rearing.

Steelhead Runs

Extensive human development, including construction of dams, has modified watershed hydrology and disrupted the natural movement and deposition of gravel, fine sediment and large woody debris in the county's creeks and streams. These modifications impair the ability of steelhead to complete the necessary freshwater portions of their life cycle.

Adding gravel and LWD, such as large logs or the root wads of trees, to streams adds complexity to streamflow by slowing down the flow, creating deep pools of calmer waters, as well as riffles of faster-moving turbulent waters. Slower streamflow makes it easier for fish to move and deep-water pools provide areas to rest and seek refuge from predators. Shallow depth riffles, on the other hand, are a good source of living organisms that the fish feed on and serve as a conveyor belt, bringing food to the fish.

Complex streamflow also traps gravel in the streambed and well-sorted gravel, free of excess fine material, is important for steelhead to build redds or spawning nests. Fish lay their eggs in the gravel and if the gravel gets filled with sand or dirt, the eggs smother. Clean gravel also increases the production of insects and other food items by creating small nooks and crannies for them to reproduce.

17,000
cubic yards of trash was removed from county waterways in FY2017-18.

Partnering with Community on Environmental Stewardship

Pollution Prevention Partnerships and Grants

Trash and debris in our waterways block flow, degrade water quality and harm wildlife. Valley Water partners with local cities, agencies and the community to keep local waterways free of trash, providing over $3.3 million in grants and partnerships since 2014. In 2018 alone, the Valley Water board approved $501,044 in pollution prevention grants.

Valley Water manages the Creek Stewardship Program and organizes two clean-up events countywide each year. On Coastal Clean Up Day 2018, 1,900 volunteers cleaned 75 miles of creeks, and removed 56,800 pounds of trash. Additionally, ongoing opportunities are provided for the community to adopt sections of creeks to clean up through the Adopt-A-Creek program. Currently, there are more than 150 active Adopt-A-Creek partners.

Meanwhile, the school outreach program teaches children about watershed pollution prevention. Regionally, the My Watershed Watch campaign engages the public in pollution prevention and litter reduction.

Through its partnerships, Valley Water removed nearly 17,000 cubic yards of trash from county waterways in fiscal year 2017-18; enough to fill five Olympic sized swimming pools. The Good Neighbor Homeless Encampment Clean Up program removed 90 percent of this trash, mainly in partnership with the City of San José. Valley Water also supports enforcement to prevent re-encampment and has partnered with the City of San José to fund the Downtown Streets Team, a nonprofit organization that provides homeless volunteers with a stipend, vital health services and case management in exchange for removing trash from streets and creeks.

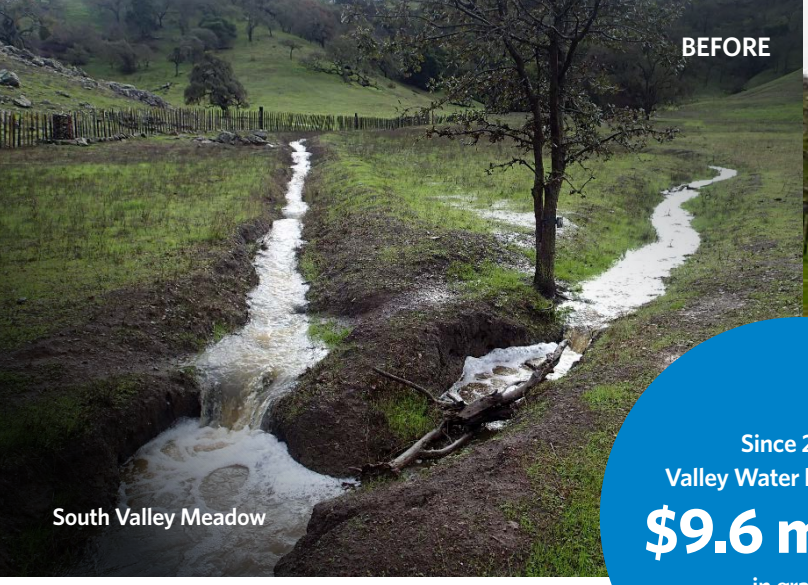
Pictured:
Volunteers coming together to clean local streams.

Restore Wildlife Habitat Grants

With a Valley Water grant of over $255,000, the Santa Clara Valley Open Space Authority (OSA) has completed the South Valley Meadow Restoration Project, bringing back seasonal wetlands in the Coyote Valley Open Space Preserve in Morgan Hill. OSA is among the 14 grantees that have received a total of nearly $4 million in Safe, Clean Water-funded wildlife restoration grants since 2014.

The South Valley Meadow project, completed in late 2017, restored an 8.5-acre seasonal wet meadow and riparian drainage complex by removing approximately 1,000 feet of agricultural drainage ditches, raising and widening about 900 feet of an incised channel and planting perennial grasses and native plant species.

The restoration reconnects the stream and the upper watershed to the valley floor, thereby allowing the landscape to capture and absorb rainfall and streamflow and replenish the groundwater basin while reducing the risk of flooding further down the creek. Furthermore, interpretive signage has been installed around the project area to inform visitors about the project, meadow/wetlands restoration, flood protection and climate change. The total cost of the project was approximately $592,000.



Since 2014,
Valley Water has awarded
$9.6 million
in grants.

In addition to the OSA project, five other grant projects have been completed and these are:

a. *Coyote Creek Invasive Plant Removal and Revegetation Project* — Working Partnerships, which received $24,750, identified and completed mapping of invasive plants species in six acres of private land along Coyote Creek and secured the California Conservation Corps as the employer of record to manage recruitment, selection and social support for a crew of 10 homeless or disadvantaged youth;

b. *Uvas Creek Steelhead Spawning Habitat Enhancement Project* — Resource Conservation District of Santa Cruz County utilized $215,579 in grant funding to remove and dispose of approximately 175 acacia trees (a non-native, evergreen species which creates creek habitat limitations) and restore 1,800 linear feet of riparian habitat;

c. *Foothills Park Riparian Enhancement Project* — Grassroots Ecology, formerly Acterra Stewardship, received $126,300 and monitored, restored, and enriched wildlife habitat along the Foothills Park's four miles of riparian corridor in the upper San Francisquito watershed. The grantee removed 2,755 linear feet of invasive plants and installed 1,025 native plants;

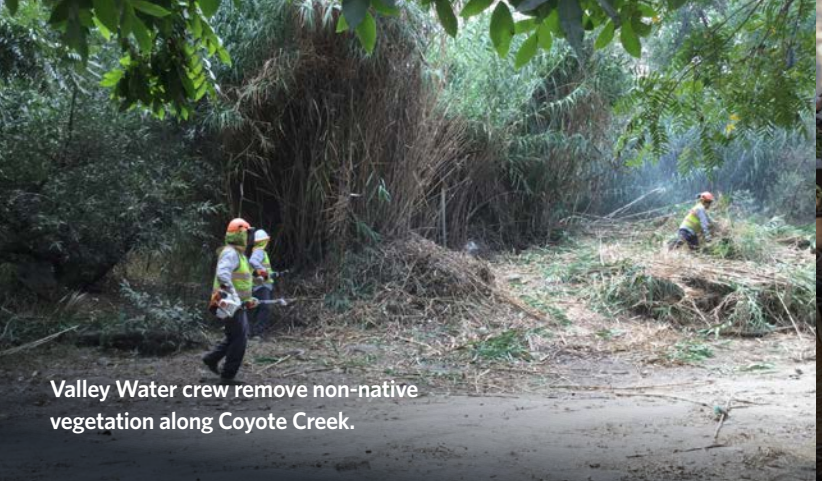
d. *McClellan Ranch Preserve Meadow Enhancement Project* — Acterra Stewardship received $164,200 for the project and removed invasive plants and established about 12,000 native plants within a riparian meadow adjacent to Stevens Creek in Cupertino; and

e. *Stevens Creek Steelhead Project* — Friends of Stevens Creek Trail received $52,162 to conduct feasible measures to remediate fish migration impediments at eight locations along Stevens Creek. As part of the project, the grantee identified potential engineering solutions to fish passage impediments and provided hydraulic analysis, conceptual drawings and estimated costs for projects at select locations.

Grants and Partnerships

Valley Water provides grants and partnerships for a variety of efforts, including restoring stream habitats, pollution prevention, environmental education and outreach, new innovative water conservation programs and technologies, and trails and open space. These grants, funded by the Safe, Clean Water Program, are offered to non-profit organizations, community groups, public agencies, schools, community colleges and universities.

Since 2014, Valley Water has awarded over $9.6 million in grants. For more information on grants, visit *https://www.valleywater.org/project-updates/grants-and-environmental-protection*.



Valley Water crew remove non-native vegetation along Coyote Creek.

Opening of Valley Water-funded Oster Elementary school garden.

Invasive plant species removal

With $200,000 from Valley Water, Midpeninsula Regional Open Space District (Midpen) is removing invasive plants from Bear Creek Redwoods Open Space Preserve in Los Gatos and creating a healthier watershed for people and wildlife.

The preserve, located on a tributary to Lexington Reservoir, was once the site of elaborate estates and gardens, which introduced invasive species to the surrounding forests where they spread unchecked for decades, crowding out native plants and disrupting the natural ecosystem.

Under a five-year partnership agreement signed in 2017, Valley Water will provide up to $1,000,000 to Midpen to remove invasive plants from their preserves. So far, Midpen has removed invasive plants from 13 acres of the Bear Creek Preserve. The effort is partly funded by the Safe, Clean Water Program, which calls for revitalizing at least 21 acres by controlling invasive exotic plants with at least 7 acres funded by community partnerships. Since 2013, Valley Water and its partners have removed invasive plant species from just over 24 acres along Coyote Creek, Guadalupe River, Saratoga Creek, Stevens Creek, and South San Francisco Bay.

To promote native plants, Valley Water has also developed five plant palettes for use on revegetation projects to support birds and other wildlife.

For more details, visit **https://www.valleywater.org/project-updates/grants-and-environmental-protection/revitalize-habitat-projects**.

Watershed Stewardship Mini-Grants

Following the success of the pilot Mini-Grants Program, Valley Water released the second round of wildlife habitat restoration and watershed stewardship mini-grants in October 2018. The total funding available in this round is $200,000.

Mini-grant applications are accepted on a rolling basis with a maximum award of $5,000 per grant, and the grant requester is required to provide matching funds of at least 25 percent of total project cost. Under the current grant cycle, Valley Water will continue to accept requests until June 30, 2019, or until the available funding is awarded. These grants are designed to support small-scale projects or help kick-start larger scale projects in the county.

Under the 2017 pilot program, 22 projects received mini-grants. The grantees included the Citizens for Environmental and Economic Justice, Grassroots Ecology, Living Classroom, Smart Yards Education, Trout Unlimited, Stanford Conservation Program, Veggielution, San Francisco Bay Bird Observatory, Guadalupe River Park Conservancy, Bay Area Older Adults, Oster Elementary School and Keep Coyote Creek Beautiful.

Bear Creek Invasive Plant Species Removal

In 2018,
Valley Water awarded over
$130,000
for three projects.

Pictured:
Valley Water-funded California Gull Predator Surveys

Water Conservation Grants

Since 2014, Valley Water has provided $676,132 in grants for a variety of new technologies and research projects, including advanced metering pilot studies, evaluating water conservation and leak notification of Smart Home devices, and studying low-cost hydroponics for cost-effective growth of leafy vegetables.

In 2018, Valley Water awarded over $130,000 for three projects, including $50,000 to the WaterNow Alliance for its Beyond Leak Detection Project – a pilot study to evaluate water conservation and leak detection benefits of next-generation leak detection devices. The study, which is currently underway, has been evaluating two devices found to have design features well-suited to encouraging water conservation. The other two projects to receive 2018 water conservation grants are:

- Purissima Hills Water District's Residential Advanced Metering Program – Purissima Hills purchased and installed 600 advanced metering devices to demonstrate that Advanced Metering Infrastructure (AMI) is an efficient tool to achieve sustained water savings in its service area. This follow-on program provides the funds to complete the AMI program substantially.
- PS Creations LLC's PlateScrape Pre-Rinse Basin for Commercial Dishwashing – PlateScrape is a device built to pre-sanitize plates more efficiently and is estimated to use 75 percent less water than current spray off methods. The goal of the project is to pilot test the new technology to determine water and/or energy savings.

Coyote Valley Partnership Project

Referred to as the "last chance landscape," Coyote Valley connects over 1.13 million acres of open space in the Diablo and Santa Cruz mountain ranges. This valley in southern San José bordering Morgan Hill contains a remarkable combination of biodiversity, farmland and water resources, and provides a critical wildlife corridor.

Valley Water is partnering with OSA to preserve and enhance the multiple benefits of Coyote Valley's water resources: natural flood protection, aquatic, riparian and wetland habitat, water quality protection, groundwater protection and recreation opportunities. With the passage of Measure T in November 2018, the City of San José is considering investment in Coyote Valley for water resources protection. Over the coming years, Valley Water will continue to coordinate with OSA and the city. Near future activities with partner agencies may include enhancement projects, riparian corridor improvements, critical wildlife linkage improvements, flood risk reduction and coordination on high-speed rail improvements.

Coyote Valley Overview

Trails Grants Foster Environmental Stewardship

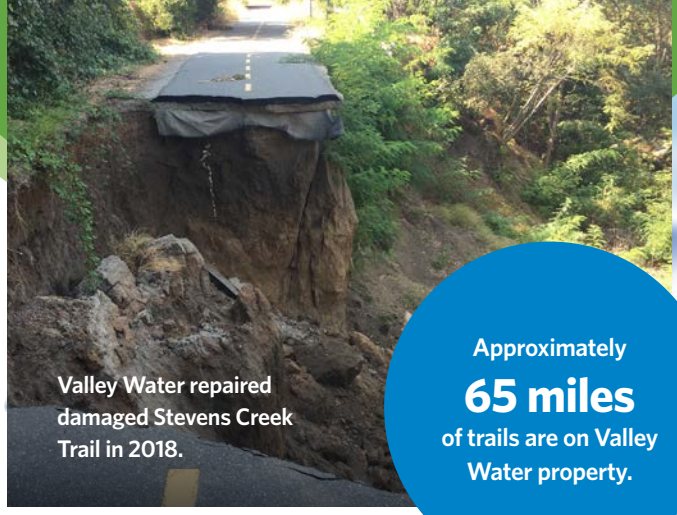
In 2018, Valley Water awarded $571,000 in trails and open space grants for three projects, taking the total trail grants awarded since 2015 to over $1.1 million. These grant projects help improve public awareness of the environment while providing access to waterways and promoting recreation, conservation and restoration.

Other efforts supporting these objectives include considering future trails when designing flood protection projects and partnering with local cities and the county for the use of Valley Water lands, such as maintenance roads along waterways, as public trails. One such popular trail is the Stevens Creek Trail near El Camino Real that Valley Water repaired and restored in 2018 after a large portion of the maintenance road was washed away during the heavy storms of 2017. The repair was carried out in two phases, with interim emergency repairs in 2017, followed up with a permanent fix completed in October 2018. The work was carried out in close coordination with the City of Mountain View.

Similarly, cyclists, pedestrians and trail lovers alike rejoiced when the Coleman Road Undercrossing Trail project in San José was completed in December 2017. The 600-foot expansion on the Almaden Trail, underneath the Coleman Road bridge, connected almost 60 miles of trails starting as far south as Fisher Creek near Santa Teresa to as far north as the Bay Trail near the border with Milpitas. Valley Water provided a $62,000 grant for this effort to the City of San José.

Another trail project completed in 2017 was the Penitencia Creek Trail between Noble Avenue and Dorel Drive in San José. The project entailed establishing a hybrid trail that included building a boardwalk structure, restoring a portion of the stream bank, developing a trailhead with interpretive signage and restoring riparian forest habitat. Valley Water granted $300,000 to the City of San José for the project.

Stevens Creek County Park Walkabout



Valley Water repaired damaged Stevens Creek Trail in 2018.

Approximately **65 miles** of trails are on Valley Water property.

Ecological Data Collection and Long-Range Planning

One Water

A long-range planning process, the One Water Plan considers many aspects of water and standardizes an approach to compare competing and complimentary water functions. The plan describes water resource conditions on a watershed scale for flood risk reduction, stream stewardship and related water supply; establishing baseline conditions and indicating where targets are being met and where there is a need for improvement. The plan itself will serve in part as a flood risk reduction plan and environmental stewardship plan for Valley Water and community.

One Water builds on existing Valley Water and partner efforts, including Natural Flood Protection program, the Water Supply Master Plan, Groundwater Management Plan, Stream Maintenance Program, Fisheries and Aquatic Habitat Collaborative Effort, Santa Clara Valley Greenprint and Santa Clara Basin Stormwater Resource Plan, to prioritize key activities needed to improve functions across the watershed. This prioritization builds on a countywide framework of five goals and 10 objectives and is further developed through watershed-specific plans for Coyote, Guadalupe, Pajaro, West Valley and Lower Peninsula watersheds. Priorities are compiled as portfolios of key projects and programs with additional recognition of important policies and partnerships. One Water priorities may then be used as a source of projects for external grant applications, recommendations to grant partners and for any future funding measure Valley Water establishes.

The draft Coyote Creek Watershed plan was completed in August 2018, while development of the remaining four watershed plans is in progress with a projected completion date of 2021.

For more information, visit **https://www.valleywater.org/your-water/one-water-plan**.

Ecological Data Collection and Analysis

This effort is critical to environmental stewardship because it allows planners and biologists to identify the most important pathways to creek and watershed health. As part of the Safe, Clean Water Program priority to Restore Wildlife Habitat and Provide Open Space, Valley Water is developing a comprehensive watershed database that tracks stream ecosystem conditions.

In 2016, the Lower Peninsula Watershed Condition Assessment was completed using the California Rapid Assessment Method (CRAM). The assessment concluded that streams in the Lower Peninsula watershed are largely in fair ecological condition (86 percent) based on CRAM Index scores, 10 percent of the streams are in good condition and 4 percent are in poor condition. Stream reaches in poor condition (Index scores ≤50) are located in mainstem channels in the highly urbanized alluvial plain near the baylands. Many of those channels have been engineered over the past 150 years and development extends right up to their banks.

Another data summary measure employed by Valley Water is the Ecological Service Index (ESI), a single number that represents the average CRAM score for the entire watershed. The ESI for the West Valley watershed was 62, the lowest of the four Ecological Data Collection and Analysis Project CRAM stream assessments to-date. Although variable throughout the watershed, the most common and significant stream and riparian area stressors observed in the Lower Peninsula watershed include transportation corridors, urban/residential stress and lack of treatment of invasive plants.

In 2018, Valley Water completed field work for the Sunnyvale, San Tomas Aquino, Saratoga, and Calabazas creeks in the West Valley watershed, and the watershed assessment is currently in preparation.

Stream Restoration Priority Plans

In 2018, Valley Water completed the Stevens Creek Stream Corridor Priority Plan to prioritize stream restoration activities in the creek and help guide Safe, Clean Water grants. Stevens Creek provides many opportunities for stream restoration. It is one of the few creeks in the Lower Peninsula watershed that has a relatively continuous riparian corridor and the lack of hardscape structures in most portions of the creek further increases habitat value. However, natural habitat is threatened by urbanization, invasive vegetation, fish barriers, bank and invert erosion, limited sediment transport and poor water quality. The 2016 Watershed Asset Management Plan rated almost all reaches of Stevens Creek downstream of the reservoir as "high risk" with high economic, environmental and social costs of channel failure, as well as high probability of channel failure.

Recommended improvement projects in the Stevens Creek Stream Corridor Priority Plan include invasive plant removal, native vegetation planting, maintenance of existing revegetation projects, stream gravel augmentation, large woody debris installation, fish passage improvements including barrier removal, water quality improvements and geomorphic function improvements including channel incision prevention and sediment balance promotion. These benefits may support Valley Water goals as well as those in existing restoration and conservation plans by other agencies.

Stream Corridor Priority Plans will also be developed for Coyote Creek, Guadalupe River, Uvas Creek and Saratoga Creek.

Pictured:
Stevens Creek

Biologist overlooking Coyote Ridge.

CRAM Results

Go to *EcoAtlas* to see all CRAM results, including the West Valley watershed and more for creeks and river reaches, tidal marshes (estuarine wetlands), and other locations. Create site reports that include CRAM results using EcoAtlas tools to identify ecosystem conditions at locations of interest.

Addressing Climate Change

Greenhouse Gas Reduction

Valley Water is poised to achieve its goal of carbon neutrality by 2020 by reducing greenhouse gas (GHG) emissions and by offsetting those emissions through other actions. Although pumping, treating and distributing water is hugely energy intensive, most of the energy used by Valley Water is carbon free.

The majority of Valley Water's carbon offsets come from green practices such as water conservation, water recycling, green business programs and carbon sequestration from wetland and riparian restoration. In fact, more than two-thirds of the carbon offsets come from water conservation programs, which help reduce the consumers' carbon footprint. (*For more information on water conservation, see Water Conservation Program on page 27.)*

Operational improvements, such as the installation of variable frequency pump drives at treatment plants and pump stations, have also reduced energy use. These efficient pump drives save about 800 megawatt-hours of electricity (MWh) annually. Valley Water uses renewable energy sources to the maximum extent feasible, with renewable energy sources expected to account for nearly 40 percent of total energy consumption by 2021. As part of this effort, solar panels were installed at Santa Teresa and Penitencia water treatment plants in 2016. These are in addition to the rooftop and solar carport installations operated at the headquarters campus in San José. Furthermore, Valley Water makes no investments in fossil fuel companies with significant carbon emissions potential.

Climate Change Resiliency

Urgent actions are necessary to adapt to a changing climate. Currently, Valley Water works to increase climate change resiliency by diversifying water supply resources to protect from droughts, incorporating sea-level rise into the design of flood protection projects and restoring wetlands in the south San Francisco Bay. To further improve resiliency, Valley Water is developing a comprehensive Climate Change Action Plan, which will identify potential future climate change impacts (vulnerabilities) and develop additional actions (strategies) to adapt to these impacts. The Climate Change Action Plan is on track for completion in 2019.

Valley Water also partners with businesses, utilities and philanthropists to improve the safety and resiliency of our community. In 2018, Valley Water joined the California Resilience Challenge, a new business-led initiative to fund climate adaptation planning statewide. Valley Water contributed $200,000 to the challenge that was launched by the Bay Area Council, a business and economic policy organization. The total amount raised through the challenge will be announced in 2019 when organizers will begin a competitive process to solicit creative and innovative local projects to address the impacts of climate change. For more information, visit **https://resilientcal.org/**.

The initiative builds on another similar collaborative effort, Resilient by Design Bay Area Challenge, which aimed to connect internationally renowned experts with local communities to inspire innovation and catalyze designs, ideas and collaboration toward a more resilient future. Valley Water contributed $175,000 to support San Francisco Estuary Institute's (SFEI) involvement in the challenge. SFEI advised on technical issues and developed scientific criteria for the evaluation of design proposals. The challenge wrapped up in 2018, with nine winning ideas. For more information, visit **http://www.resilientbayarea.org/**.

For more information on climate change efforts, visit **https://www.valleywater.org/your-water/water-supply-planning/climate-change**.

In 2018, Valley Water contributed

$200,000

to the California Resilience Challenge.

Workplace Green Team

A volunteer group of employees at Valley Water, the Green Team is actively inspiring employees and the organization to make sustainable choices.

One of its main activities is hosting the annual Earth Day event and the 2018 event focused on how to "End Plastic Pollution." It included a "trash museum" that showed how long plastic items take to degrade. Employees also received information about Rethink Disposable program, biking, commute alternatives, electric vehicles, climate change, the impact of our food choices and composting made easy.

Throughout the year, the Green Team also provides reusable dishes and cutlery for employee events. In 2018, it also collaborated with the ReThink Disposable campaign by Clean Water Action to analyze the use of reusable dishes in Valley Water cafeteria, and now participates in the procurement process for a cafeteria vendor. The Green Team is also working on the "Say No to the Straw" campaign including piloting paper straws at the cafeteria.

In 2018, the Green Team began a waste reduction campaign and distributed mini-trash cans to staff. Other organizations have used these cans for over 20 years and found it effective in reducing waste and increase recycling.

Green Team

Pictured:
"Say No to the Straw" Campaign

Stevens Creek Streambank Restoration

Pictured: Uvas Creek Steelhead

Stream Stewardship Projects

Valley Water is committed to protecting Santa Clara County's riparian and aquatic resources. It funds, implements, supports and promotes stream stewardship projects to enhance habitat for native fish, including the federally threatened steelhead. The following projects were completed in the last three years or are substantially underway.

Restoring Habitat for Steelhead

Gravel and Large Woody Debris Augmentation

In 2018, Valley Water completed two of the projects recommended in the Study of Santa Clara County Steelhead Streams to Identify Priority Locations for Gravel Augmentation and Large Woody Debris Placement. A total of over 32 cubic yards of large woody debris and 240 cubic yards of spawning gravel was installed at priority sites in Stevens Creek in Cupertino and Alamitos Creek in San José.

Lower reaches of Stevens Creek provide high quality habitat for steelhead. To improve this habitat, Valley Water installed a gravel injection pile and large woody debris in an impaired reach downstream of McClellan Road in Cupertino. Similarly, in-stream habitat was also improved by placing woody debris and gravel in Alamitos Creek, upstream of Mazzone Drive, in San Jose. In 2019, in-stream enhancement will also be carried out in Los Gatos Creek at Campisi Way in Campbell.

Valley Water has removed **more than 20** fish passage impediments in the past 20 years.

Stevens Creek Fish Passage

Stevens Creek gravel and large woody debris placement

Alamitos Creek gravel and large woody debris placement

Stevens Creek Fish Passage Barrier Removal

In late 2015, Valley Water removed fish passage impediments in Stevens Creek in downtown Mountain View to create better passage conditions for steelhead to migrate upstream to spawn and rear.

At the project site under Evelyn Bridge, steelhead were unable to migrate to the upper watershed because even during low flows, water was getting diverted into the adjacent high-flow bypass box culvert leaving the natural creek dry. The diversion was a result of sediment accumulation, caused by two concrete weirs, or drop structures, and erosive flow patterns upstream and downstream of the bridge.

The project included removing the two concrete weirs, excavating a low-flow fish passage channel and constructing grade control structures to slow the stream flow so that fish can easily swim upstream. With the drop structures eliminated, crews also removed the antiquated and redundant fish ladder that had proven to be ineffective most of the time. To keep the water within the natural channel during medium and low flows, Valley Water also installed a side weir adjacent to the box culvert. Additionally, the channel was lined with boulder clusters and rocks to create refuge for migrating fish and prevent future erosion.

The project cost approximately $1 million and was funded by the Safe, Clean Water Program. Under the program, $6 million is allocated for fish passage improvements across the county. With this project, Valley Water has removed more than 20 fish passage impediments in the past 20 years.

Almaden Lake Improvement Project

In 2019, Valley Water expects to release a draft Environmental Impact Report on the project to reduce methylmercury production in the lake and its concentration in fish, remove fish passage impediments posed by the lake and restore 1,765 feet of natural creek habitat.

Remnant mercury from the long-closed New Almaden Mines has deposited in Almaden Lake (formerly a rock quarry), resulting in methylmercury-related water quality issues. Furthermore, currently, Alamitos Creek flows through the lake, which not only results in the lake's methylmercury-containing and warmer water being released downstream but is also harmful to migrating steelhead as it risks fish getting entrained or stranded in the lake or becoming vulnerable to non-native predatory fish that live in the lake.

The project will isolate and restore Alamitos Creek within the existing footprint of the lake to address the problems posed by the current comingled system. The project will also create channel complexity in the restored Alamitos Creek such as instream riffle-pool habitat, cover for rearing fish, gravel to support spawning and plantings that will provide numerous ancillary wildlife benefits.

Singleton Road Bridge Fish Passage Improvement Project

Valley Water has allocated up to $1 million in funds to support the City of San José efforts to remove the fish passage barrier at the city-owned Singleton Road crossing on Coyote Creek near Capitol Expressway. The city has a project to remove the barrier and restore a free-flowing condition for Coyote Creek along with constructing a bicycle and pedestrian bridge at bank elevation. While the city is trying to secure funding for this project, Valley Water has offered to remediate the fish passage impediment on an interim basis, which can be done sooner. If an agreement can be reached on design and the Valley Water board and city council approve the project, the removal of the impediment will facilitate movement of migratory fish to 17.6 miles of creek habitat upstream of the site.

Singleton Road Crossing

Bolsa Road Fish Passage Improvement Project

Bolsa Road Fish Passage Improvement Project

Under this project, Valley Water will remove a barrier to fish passage in the Uvas-Carnadero Creek at the Union Pacific Railroad Bridge crossing in Gilroy. The improvements, which include constructing a channel with stream flow complexity such as pools and riffles, will provide steelhead access to approximately 22 miles of higher quality habitat upstream. Construction on the project is expected to begin in 2019.

Ogier and Metcalf Creek-Lake Separation Projects

In 2018, Valley Water completed the Ogier Ponds (formerly quarry pits) Feasibility Study, which determined that removing the surface hydraulic connection between Coyote Creek and Santa Clara County-owned Ogier Ponds is technically feasible and it would enhance healthy steelhead population as well as support water-based recreation. Separating the creek from the ponds would enhance aquatic habitat and lower creek water temperature, thus improving the conditions for the salmonid population. Currently, the creek flows through the ponds located in southern San José, downstream of Anderson Reservoir.

In late 2018, the board approved moving forward with a planning study provided the county finalizes the memorandum of agreement (MOA) with Valley Water. A planning study would include more detailed information on project alternatives and evaluation of costs, design features, advantages, disadvantages and benefits of those alternatives to support the selection of a preferred project.

During the year, Valley Water also initiated the Metcalf Ponds Feasibility Study to evaluate alternatives for separating Coyote Creek from the instream percolation ponds (once quarry pits) to improve fish habitat and passage. The feasibility study is expected to be completed in 2020. If a feasible alternative(s) exists, Valley Water will work with the county to proceed with a planning study to evaluate and recommend a preferred project for implementation.

Pictured:
Almaden Lake
Improvement Project

Almaden Lake

Valley Water has allocated up to

$1 million

in funds to support the City of San José efforts to remove the fish passage barrier at Coyote Creek.

Stevens Creek Fish Passage Evaluation Study

In spring 2018, a study was initiated to evaluate 32 potential fish passage barriers along 12.5 miles of Stevens Creek downstream of Stevens Creek Reservoir. It will ascertain the degree to which these potential barriers impede movements of steelhead in the creek as well as determine the priority for addressing the impediments. Results of this study will provide additional information so that future stream stewardship activities offer maximum benefit to steelhead populations. Results of the analysis are expected in Spring 2019.

For more information on fish habitat improvement, visit **https://www.valleywater.org/project-updates/creek-river-projects/fish-habitat-passage-improvement**.

Restoring and Realigning Creeks for Stability and Resiliency

Calabazas and San Tomas Aquino Creeks

Valley Water is exploring the feasibility of directly connecting Calabazas and San Tomas Aquino creeks to Pond A8 in South San Francisco Bay to help with bayland habitat restoration, resilient flood management and reduced maintenance.

Very few creeks in the South Bay historically flowed directly to the bay, but rather fanned out into seasonal wetlands and ponds, and Calabazas and San Tomas creeks were no exception. By the early 1920s, Calabazas and San Thomas Aquino creeks were directed into managed sloughs, Guadalupe and Alviso sloughs, respectively, and were cut off from the tidal wetlands by levees constructed for commercial salt production. In the 1960s, San Tomas Aquino was further realigned to the west by making a 90-degree turn to facilitate the construction of a landfill on the north and east of the creek. This arrangement not only cut the creeks off from the tidal marsh but created an extremely inefficient hydraulic/sediment conveyance system.

Reconnecting the creeks to the former salt pond being restored as part of the SBSPRP will enhance the tidal marsh restoration effort by providing an additional source of sediment supply from the Calabazas and San Tomas Aquino watersheds. This additional sediment will also help establish the transition zones, or ecotone, along the southern edge of Pond A8. This project will also bring other ecological benefits such as facilitating the development of new salt marsh habitat and improving connectivity between patches of existing habitat.

By improving hydraulic connections and allowing sediment to settle out in the pond, this project is expected to reduce the amount and frequency of sediment removal required to maintain flood conveyance capacity of the creeks. In September 2018, Valley Water hosted a meeting where the San Francisco Estuary Institute presented a resilient landscape vision report for directly connecting the two creeks to tidal restored Pond A8. A feasibility study is currently under way and is expected to be ready in 2019.

Hale Creek Pilot Project

Valley Water has completed 60 percent design plans for the restoration of an approximately 500-foot long concrete-lined section of Hale Creek between Marilyn Drive and Sunshine Drive in Mountain View. The Safe, Clean Water Program-funded pilot project is an opportunity to replace the over 50-year hardscaped stretch of the creek with vegetated soft-bottom channels to enhance creek habitat and provide an ecosystem that promotes riparian diversity, delivers flood protection and restores stream recharge capabilities within the project reach. The design plans are scheduled to be completed in 2019 and construction to begin in 2020.

Mercury

San Jose's mercury-laden history is evident in the names of our roads, parks and even our newspaper. The New Almaden Mining District, North America's most productive historical mercury mine, operated from 1845 to 1975, liberating over 88 million pounds of mercury from the Cinnabar Hills. Creeks once used as repositories for mining waste now host reservoirs containing among the highest fish tissue mercury concentrations in the nation.

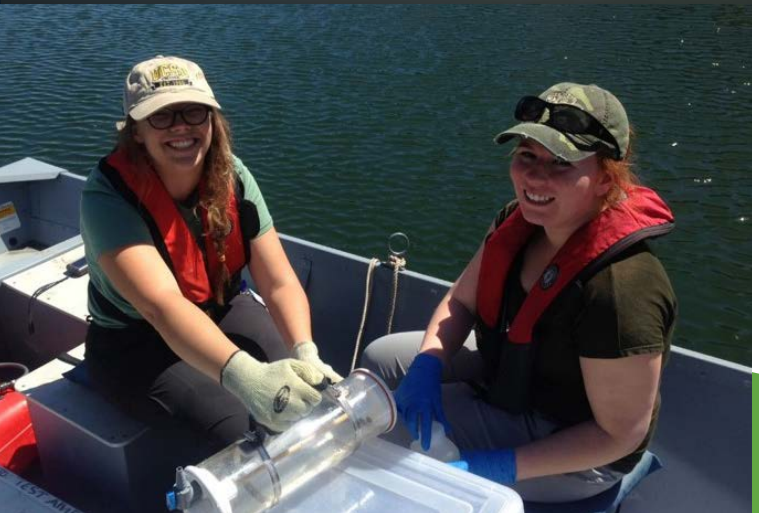
Not all forms of mercury are equal. In reservoirs, summer oxygen depletion creates conditions that support the conversion of mercury to methylmercury: a potent neurotoxin that accumulates in fish and animal tissues. Birds and humans that consume contaminated fish are at risk for reproductive damage, neurological disease and cardiovascular issues. Because methylmercury concentrations in fish are typically millions of times higher than concentrations in the water, even tiny amounts of mercury in a reservoir can cause problems.

Fish Sampling

Oxygenation System

Valley Water removed **over 15,000 lbs** of mercury from creeks in fiscal year 2017-18.

Calero Reservoir



Combating the Legacy of Mercury Mines

Reservoir Treatment Systems

To combat methylmercury production and bioaccumulation, Valley Water operates oxygenation systems in four reservoirs: Almaden, Calero, Guadalupe and Stevens Creek. These systems generate oxygen and pump it into the bottoms of reservoirs, discouraging low-oxygen conditions responsible for methylmercury release from sediments.

Preliminary results of Valley Water's oxygenation studies indicate that methylmercury concentrations at the reservoir-bottoms are significantly reduced during system operation. The two most contaminated reservoirs, Almaden and Guadalupe, show declining trends in fish tissue mercury concentrations. These scientific studies are informing statewide efforts to reduce mercury in fish.

During the summers of 2017 and 2018, Valley Water conducted reservoir angler surveys to assess public awareness of health risks involved with consumption of fish caught in local lakes and reservoirs. Valuable sociodemographic and consumption data was gathered in the 409 surveys, which will help researchers assess risk and inform future outreach efforts. The project is funded by the Safe, Clean Water Program.

Valley Water regularly removes sediment accumulations from streams that present flooding risks. Sediment from each project is tested and if mercury concentrations exceed regulatory limits, it is disposed of in a landfill where it cannot be remobilized. In the fiscal year 2017-18 (July 1, 2017, to June 30, 2018) alone, Valley Water removed over 15,000 pounds of mercury from creeks.

For more information, visit **https://www.valleywater.org/project-updates/grants-and-environmental-protection/impaired-water-bodies-improvement**.

Zebra Mussels (Veliger)

Keeping Invasive Species out of County Waterways

Zebra and Quagga Mussel Prevention Plan

In 2018, among all the agencies in California with non-infested waterbodies, Valley Water became the first to get its Mussel Prevention Plan officially approved by the California Department of Fish and Wildlife (CDFW).

In 2008, following the discovery of invasive zebra mussels in San Benito County's San Justo Reservoir, Valley Water partnered with the County of Santa Clara and instituted an ongoing mandatory boat inspection and monitoring program that is equally cost-shared between the two agencies. As a result of the program, so far, the invasive mussels have not arrived in the county.

Although the program has been running successfully for a decade, new state regulations require agencies to submit plans to CDFW that meet all its stringent requirements, including:

- An assessment of the vulnerability of the reservoir for the introduction of both adult and veliger (larvae) dreissenid mussels;
- A monitoring program to detect the presence of adult and/or veliger dreissenid mussels; and
- Management of recreational activities to prevent the introduction of mussels and, if present, prevent them from migrating from the waterbody; this effort includes public education and outreach.

For more information, visit **www.valleywater.org/your-water/water-quality/protecting-your-water/invasive-mussels**.

Uruguay water-primrose infestation

Valley Water removed approximately **7 acres** of invasive species Uruguay water-primrose.

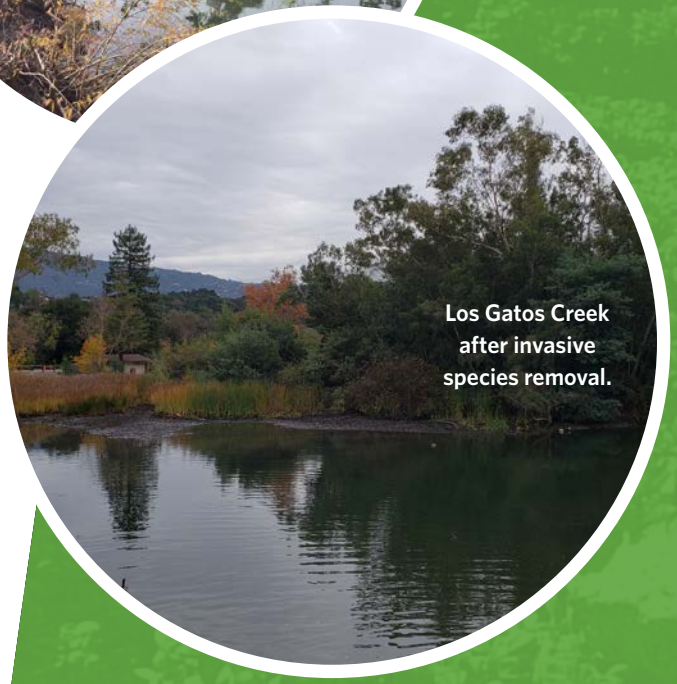
Quick Response to Invasive Plant Emergency

In late 2018, Valley Water became aware of an infestation of an invasive species Ludwigia hexapetala or Uruguay water-primrose in Los Gatos Creek in the vicinity of Vasona Reservoir. This was the first known appearance of this aggressive invasive in Santa Clara County.

The Uruguay water-primrose is an aquatic plant that forms dense mats in waterways, reaching above and below the water surface. It impedes water movement, blocks the growth of native plants and reduces available habitat for waterbirds and fish. Although this species has been naturalized in California for at least 25 years, it has grown exponentially in the past several years, leading to increased concern over its impacts on waterways.

While the Uruguay water-primrose was likely introduced to the reservoir by boats or waterfowl, pieces of the mats can catch on a boat and other watercraft that then spread plants to new areas. This infestation in Vasona Reservoir had spread to Los Gatos Creek upstream and downstream of the reservoir. Valley Water obtained permission to conduct removal work on Santa Clara County Parks and Recreation Department land on the creek, upstream of the reservoir.

Although this species is not on the list of invasive species covered under Valley Water's Stream Maintenance Program, resource agencies were requested to allow for the removal under the program. Soon after receiving agency approval, Valley Water began removing the invasive plants in November, before winter storms dispersed it throughout Los Gatos Creek and Guadalupe River. An aquatic weed harvester was used for a total of 10 days removing the Uruguay water-primrose in the reservoir. Hand removal efforts occurred for 18 days in Los Gatos Creek and throughout the reservoir and approximately 6.95 acres of Uruguay water-primrose were removed. Follow-up treatment will be necessary for three to five years to eradicate the species.

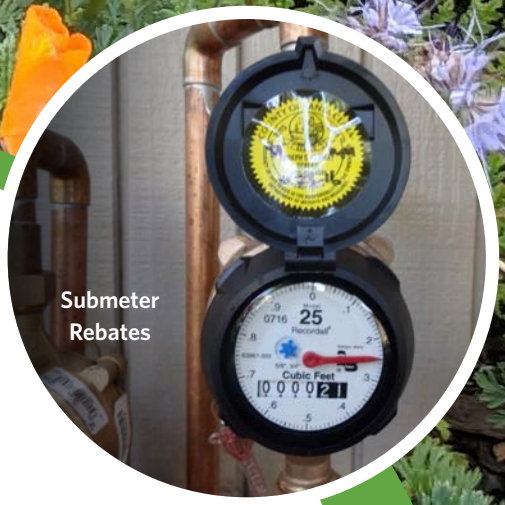


Los Gatos Creek after invasive species removal.

Zebra and Quagga Mussels

Although tiny, zebra and quagga (dreissenid) mussels are highly invasive freshwater species that pose a serious threat to native aquatic ecosystems and fisheries, recreational boating and fishing, water delivery systems, hydroelectric facilities, agriculture and the environment in general.

These mussels attach to boats, aquatic plants, bait buckets and other water-recreation equipment and spread when these items are moved from infested waters to another water body. Their microscopic larvae can be transported in a live well, bilge or bait bucket. Once introduced, they quickly and prolifically colonize the slow-moving water of lakes, reservoirs and even streams.



Submeter Rebates

Helping Improve Water Reliability

Water reliability and quality are jeopardized by recurring droughts as well as climate change, affecting our ecosystems and the community. In its effort to continue to provide a clean and reliable water supply, Valley Water is making smart investments in new and innovative technologies like water reuse, modernizing current delivery structures, expanding water conservation programs and supporting water conservation academic research.

In fiscal year 2017-18, the community saved over **24.4 billion** gallons of water.

Keep up the good water-saving work.

Your water-saving efforts help us to continue to provide the community with safe, clean water for a healthy life, environment, and economy.

Thanks for helping to make water conservation a California way of life.

Making Conservation a Way of Life

Water Conservation Programs

The historic drought is over, but the next drought may be just around the corner. With such a variable climate, Valley Water considers water conservation essential to ensuring long-term reliability and offers a wide range of conservation programs to residents, businesses and agriculture.

In fiscal year 2017-18, the community saved over 24.4 billion gallons of water. This was achieved by installing low water-use landscapes and efficient irrigation equipment as well as indoor plumbing fixtures such as high-efficiency toilets and washing machines.

The community understands that conservation must be a California way of life. Valley Water helps facilitate this lifestyle through its residential and commercial rebate programs.

Programs offered to county residents include rebates for installing "laundry-to-landscape" graywater systems and certain water-efficient irrigation equipment; free water-wise outdoor surveys; do-it-yourself water-wise indoor surveys; and free showerhead and faucet aerators.

Commercial, industrial and institutional sector programs include installation of high-efficiency toilets and rebates for installing water-efficient technologies and submeters. Additionally, a range of landscape rebate programs is offered to both residents and businesses. As a result of the last drought, Valley Water also has water waste inspectors who respond to reports of water waste and violations of local water-use restrictions.

Furthermore, Valley Water is working with stakeholders, including water retailers, to develop a Model Water Efficiency New Development Ordinance.

For more information, visit **https://www.valleywater.org/water-conservation-programs**.

Conservation Education and Outreach

Effective education and outreach are vital for the success of conservation programs, especially during times of drought.

Valley Water's education and outreach efforts include informative class presentations, community workshops, and online videos and tools, all complemented by a multi-language media campaign. During the spring and summer seasons, Valley Water runs a paid advertising campaign to support our water conservation goals. In the last year, the water education outreach team engaged over 17,590 county residents through education programs focused on water issues.

Valley Water also partners with water retailers, local chambers of commerce and community leaders, like the Landscape Committee members, to amplify the conservation message to residents and businesses through bill inserts, presentations, workshops and a series of educational videos.

Pictured: Conservation Education Campaign

Reverse Osmosis

Silicon Valley Advanced Water Purification Center

Tour Group Taste Testing

Landscape Rebate Study

Landscape rebates are a vital part of water conservation efforts by the state and its water agencies. In 2017, Valley Water completed a study to determine whether these rebates led to measurable water savings.

The study, titled "Water Savings Analysis of Turf Removal and Irrigation Equipment Rebates," focused on single-family residences, which constitute the largest segment of Valley Water's Landscape Rebate Program.

Retailers provided Valley Water with up to eight years of water-use billing data of program participants. The study compared the participants' water use before and after the installation of a new landscape or irrigation equipment. It showed that the turf removal and irrigation equipment rebate programs could be successful in achieving significant water conservation. The report can be accessed at **https://www.valleywater.org/saving-water/studies-and-reports**.

Since 2014, SVAWPC has produced

6,846 million

gallons of purified water.

Potable Purified Water

By 2025, Valley Water plans to develop up to 7.8 billion gallons a year of additional potable purified water to augment our groundwater supplies. This amount of water is enough to supply nearly 48,000 families of five for a year.

Reusing Water for Sustainability

Purified water: the wave of the future.

With the resilience of California's water resources in question, Valley Water is investing in locally reliable, sustainable and efficient water supplies, such as recycled and purified water.

The goal is for recycled and advanced purified water to provide for at least 10 percent of the total county water demands by 2025. To that end, Valley Water plans to develop up to 7.8 billion gallons a year of additional purified water for potable (drinkable) reuse by the year 2025 and up to 14.7 billion gallons a year in the longer term. In addition, Valley Water continues to support the production and expansion of recycled water, or non-potable reuse.

Valley Water's advanced purified water plans began taking form in the mid-2000s and in 2014, the Silicon Valley Advanced Water Purification Center (SVAWPC) began operation. Located adjacent to the San Jose/Santa Clara Regional Wastewater Facility (RWF), SVAWPC employs a safe and reliable process using micro-filtration, reverse osmosis and ultraviolet radiation to purify treated wastewater from RWF. The purified water is blended with RWF's tertiary-treated wastewater for local non-potable reuse. When used for potable reuse, the purified water would be further treated with advanced oxidation processes, which combine ultraviolet radiation with a chemical oxidant such as hydrogen peroxide for the removal of any residual organic compounds.

During the 2012-2016 drought, Valley Water committed to expanding its advanced purified water program and began evaluating potable reuse options, including:

- Expanding the SVAWPC and/or constructing additional advanced purification facilities near other wastewater treatment plants in Santa Clara County [e.g., cities of Sunnyvale and Palo Alto, and the South County Regional Wastewater Authority (serving the cities of Morgan Hill and Gilroy)] to increase production of purified water to up to 32 million gallons of water per day (mgd).

- Constructing approximately 30 miles of transmission pipelines, primarily through urban areas, to convey purified water to existing groundwater recharge ponds and, in the longer term, to existing conventional water treatment facilities.

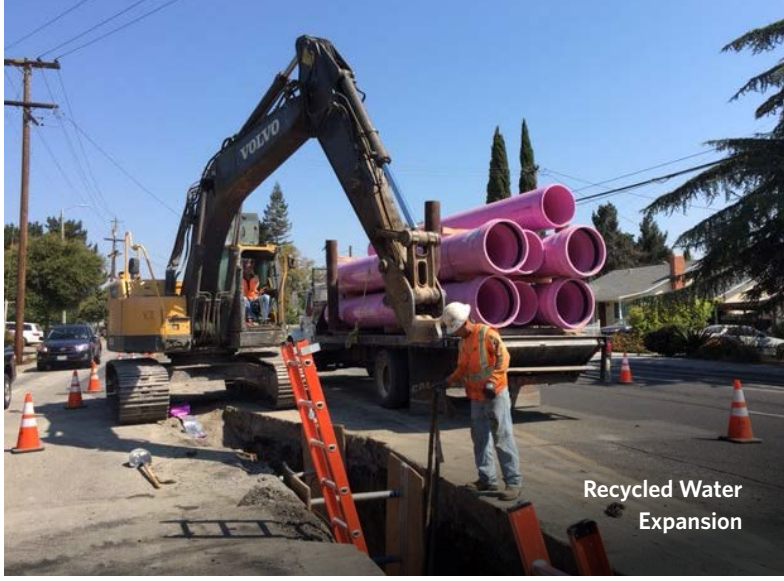
Valley Water is pursuing a public-private partnership (P3) for the proposed $950 million purified water program to transfer the project's financial, technical and operational risks to a private entity. A P3 approach may yield cost savings through innovation, may expedite a project's implementation, and is expected to provide with price certainty and long-term buy-out provisions.

Valley Water is also engaging with the San Francisco Public Utilities Commission and the Bay Area Water Supply and Conservation Agency to evaluate options for either or both agencies to participate in the advanced purified water program. The objective is to annually supply other agencies with an agreed-upon volume of purified water in exchange for their financial participation in Valley Water's program. The draft report on this effort was prepared at the end of 2018.

Meanwhile, a Countywide Water Reuse Master Plan is being developed and will be completed in Fall 2019. It will facilitate the integration, expansion and development of purified water systems in the county in partnership with recycled water producers, wholesalers, retailers, users and other interested parties. It will identify and prioritize the development of purified water programs for indirect and/or direct potable reuse.

A challenge to the expansion of advanced purified water operations is the management of the reverse osmosis process byproduct, known as reverse osmosis concentrate (ROC). Valley Water is conducting comprehensive ROC management plans for five potential advanced purified water projects in the county (Gilroy, Morgan Hill, Palo Alto, San Jose, Sunnyvale). The effort includes an engineered treatment cell pilot (wetland) in collaboration with the University of California at Berkeley, Stanford University and the San Francisco Estuary Institute. This study is expected to be completed by December 2019.

For more information, visit **http://www.purewater4u.org**.



Recycled Water Expansion

Non-potable recycled water expanded

Valley Water has been helping develop and expand recycled water for non-potable reuse for large-scale purposes, such as irrigation and industrial use, for over two decades. Purple signs dot business park landscapes and golf courses outfitted with traditional recycled or purple pipe systems that denote non-potable recycled wastewater.

In December 2017, Valley Water celebrated the completion the Wolfe Road Recycled Water Facilities Project, bringing recycled water to a portion of Sunnyvale and Apple's new corporate campus in Cupertino. While Apple is the first recycled water customer for the Wolfe Road pipeline, the project is designed to allow for the potential future expansion of Sunnyvale's recycled water system for parks and business customers and future extension into the city of Cupertino.

The project included building 2.5-miles of 24-inch diameter recycled water pipeline underneath Wolfe Road. A collaboration between Valley Water, Sunnyvale, Apple Inc., and the privately owned California Water Service Company, the project is a shining example of how Silicon Valley businesses and local governments can successfully invest in our region's infrastructure and commit to building our water resources. Both private companies contributed over a third of the total project cost of approximately $15 million.

Valley Water plans to develop up to

7.8 billion

gallons a year of additional purified water for potable reuse by the year 2025.

Valley Water Lauded for Purified Water Outreach

Valley Water received the 2018 Silicon Valley Conservation Award for Education for its purified water outreach efforts, which include free tours of the Silicon Valley Advanced Water Purification Center in San José.

In 2018, over 1,200 visitors toured the purification center. Among the highlights was the Senior Water Tour Day in September, when 256 seniors took the tour. In addition to residents, delegations from South Korea, Brazil and Singapore explored the purification center. On average, post-tour surveys showed that more than 90 percent of participants support the concept of using purified water to bolster drinking water supplies.

Valley Water also launched a new social media campaign to promote the tours and recycled and purified water as a sustainable and reliable water source of the future.

Students Learn About Water Purification

Restoring a Healthy Delta Ecosystem

Tule Red Tidal Restoration Project

Since Santa Clara County receives over half of its water supply from the Sacramento-San Joaquin Delta watershed, protecting and restoring the health of the Delta ecosystem is critical to maintaining access to those supplies. To that end, Valley Water has been active in Delta science and restoration efforts and the Tule Red Tidal Restoration Project is one such example.

After a soggy start to construction in 2017, the Tule Red project is on track to be completed in the fall of 2019. The Tule Red property is an approximately 2,000-acre site with about 400 acres of land above the tidal range on the eastern edge of Grizzly Bay in the Suisun Marsh. It has been a managed duck club for over 40 years and will be restored to a self-sustaining brackish tidal marsh to support Delta smelt, longfin smelt and several salmonid species. Restoration of these managed lands to natural tidal habitat is expected to increase food availability and improve habitat conditions for fish listed under the Endangered Species Act.

Suisun Marsh is the largest contiguous brackish water marsh remaining on the west coast of North America, once encompassing more than 74,000 acres of marshlands. Much of the tidal wetlands were diked and converted to managed duck clubs, which resulted in the loss of critical habitat for threatened and endangered aquatic species. Approximately 79 percent of tidal wetlands in Suisun Marsh have been lost since the 1800s.

Bacon Island Levee

In 2011, Valley Water, along with Metropolitan Water District of Southern California and Westlands Water District, each contributed about $413,000 to acquire the Tule Red property and joined forces with the State and Federal Contractors Water Agency (SFCWA) to complete the planning, design, environmental documentation, permitting and construction of the project.

The restoration project will contribute 610 acres of credit toward the obligations under the 2008 biological opinion issued by the U.S. Fish and Wildlife Service for the operation of the State Water Project (SWP) and Central Valley Project (CVP).

Valley Water, along with other SWP and CVP contractors, undertook this project to help meet those obligations in a timely and cost-effective manner. Since this project will contribute to the required 8,000 acres of intertidal and associated sub-tidal habitat, the Department of Water Resources (DWR) is reimbursing the participating water agencies for project costs. Upon completion of the project, DWR will allocate the project costs to all the SWP contractors.

For more information, visit **https://www.valleywater.org/your-water/where-your-water-comes-from/imported-water/california-ecorestore**.

Bacon Island Levee Rehabilitation Project

Bacon Island is situated in the central Delta between Old River and Middle River. Old and Middle Rivers are the main pathways for Valley Water's imported water supplies conveyed from the Sacramento River to the State Water Project (SWP) and Central Valley Project (CVP) pumping facilities in the southern Delta. A failure of the levees around Bacon Island could significantly impact the quality and quantity of imported water supplies.

This project will rehabilitate approximately five miles of levee to the recommended design standard while minimizing potential impacts and incorporating habitat enhancements into the project design. Construction on the project began in June 2018 and is expected to be completed by the end of 2019.

The project's habitat enhancement features include the hydroseeding of native grasses and development of Scrub Shrub and Riparian Forest in levee-maintenance-compatible areas. These enhancements will not only compensate for the minimal construction-related impacts of the project but will provide a net increase in native habitat extent and quality on Bacon Island.

DWR is funding 97 percent the project cost of about $10.5 million and a coalition of seven urban water agencies, including Valley Water, is providing the remaining 3 percent. In-kind funding is also being provided by PG&E and by the local reclamation district who will be taking approximately 30 acres of farmland out of production and will assume the costs associated with constructing and maintaining the habitat improvements, as well as provide staff time to plan and implement the project.

Tule Red Main Channel Construction

Upper Penitencia Creek

Natural Flood Protection

As Santa Clara County has grown, so has the need for flood protection. Traditionally, flood protection meant building straightened grassland and concrete channels that moved floodwaters quickly and efficiently but were not in harmony with the natural environment.

However, the 1990s ushered in a new era of environmental awareness and Valley Water began to design projects that balanced flood protection with protecting local streams as natural resources. Now, we strive for flood protection projects to be multi-objective projects that provide flood protection along with habitat enhancement and recreation. Besides developing multi-objective projects, natural flood protection also means using best management practices, restricting the use of hardscape, such as concrete, while promoting the use of soft methods that provide better habitat, and often doing more than what is required by regulatory agencies.

Some of the multi-purpose projects that are currently underway and provide additional ecological and recreational benefits are detailed below. All the projects, except Sunnyvale East and West Channels Flood Protection Project, will receive Safe, Clean Water Program funding.

Pictured:
Alamitos Creek Mitigation Site

Protecting Human and Natural Communities

The South San Francisco Bay Shoreline Project

First of its kind in the San Francisco Bay area, the project combines coastal flood protection with wetland restoration. The South Bay shoreline has seen increased flooding in recent years due to severe storms combined with high tides. Climate change is expected to make coastal flooding more prevalent and severe, increasing the risk to thousands of residents, many high-tech companies and critical infrastructure, including roadways and three wastewater treatment plants.

The project will provide coastal flood protection, restore and enhance tidal marsh and related habitats as well as expand recreational and public access opportunities by using a combination of flood protection levees, wetlands and ecotones, which are transitional zone habitats. Ecotones will provide an additional protective buffer for the levee and allow marsh habitat to migrate upslope as sea level rises. This approach of using natural infrastructure will help develop a resilient and adaptable flood protection system that can evolve in the future.

The project aims to provide flood protection to areas in Palo Alto, Mountain View, Sunnyvale, San José and the community of Alviso.

The first phase of the project to be constructed is planned for Economic Impact Area (EIA) 11, which is the urban area of North San José and the community of Alviso. The EIA 11 design and construction costs alone are estimated at $177 million and include constructing a four-mile-long engineered levee and restoring up to 2,900 acres of tidal marsh habitat.

In 2018, the project received a significant stimulus with the federal government awarding it $177.2 million in disaster supplemental funding. The project is also the first to include protection for rising seas. Construction is scheduled to begin in 2019. During the year, Valley Water also secured approximately $4.4 million from the San Francisco Bay Restoration Authority in the first round of grants awarded under Measure AA.

The project will also receive $15 million from the Safe, Clean Water Program as part of Valley Water's cost share toward design and construction of EIA 11. Another $5 million is allocated towards the completion of the planning study for EIAs 1-10.

The project is a partnership with the California State Coastal Conservancy, the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service and regional stakeholders. It is being coordinated with the South Bay Salt Pond Restoration Project, which seeks to restore historic wetlands on 15,100 acres of former salt ponds in the South Bay.

For more in information, visit **https://www.valleywater.org/project-updates/creek-river-projects/san-francisco-bay-shoreline-protection**.

San Francisquito Creek

Ridgway's Rail

San Francisquito Creek Flood Protection (Phase 1)

To be completed in early 2019, the project is an example of Valley Water enhancing habitat beyond the regulatory requirement. The project is sponsored by the San Francisquito Creek Joint Powers Authority (SFCJPA) of which Valley Water is a member agency. The county of San Mateo and East Palo Alto, Palo Alto and Menlo Park are the other SFCJPA members.

The project will protect areas of East Palo Alto and Palo Alto at and downstream (east) of Highway 101 from flooding, create recreational opportunities and enable additional flood protection work upstream (west) of Highway 101. Valley Water has played the lead role in the project by acting as the primary source of funding, providing engineering and design support and managing the construction contract.

The project, which required building floodwalls and levees to provide adequate flood protection, is also designed to restore and enhance habitat along the project reach, particularly tidal marsh and habitat for threatened and endangered species. Before the project, the creek was constrained between narrow levees and supported only 4.5 acres of adjacent tidal marsh. The project is required to create approximately 14 acres of tidal marsh to mitigate for construction and other habitat impacts. Instead, nearly 17 acres of floodplain with suitable elevations for tidal marsh has been created. This floodplain is now being seeded and planted with native tidal marsh plants to create the conditions necessary to support threatened and endangered species.

Valley Water will continue to monitor and maintain the tidal marsh site for at least five years before determining if the habitat creation has been successful.

Furthermore, it is not uncommon for Valley Water to design and maintain flood protection projects so that habitat benefits go beyond the regulatory environmental mitigation requirements. In 2018, over 173 acres of mitigation lands were maintained beyond the regulatory requirements.

Upper Llagas Creek Flood Protection Project

The Safe, Clean Water Program-funded project to provide flood protection to urban areas of Morgan Hill will be constructed in two phases, with Phase 1 construction beginning in Spring 2019. Work for this phase consists of channel widening and deepening, instream improvements for wildlife and habitat and revegetation. Some of the project environmental elements that go beyond the regulatory requirements are (combined Phases 1&2):

- Approximately 13 acres of invasive plant removal
- In-stream complexities-woody debris (464 instream complexity features including divide logs, wing deflectors, root wads and boulder clusters)
- 10 turtle basking sites within wetlands
- 27 invasive trees to be girdled for bat/owl habitat
- 14 bat boxes
- Upland log piles at 148 locations
- Removal of legacy trash and hardscape debris from 2.3± acres
- Approximately 11 acres of in-fill native planting

Sunnyvale East and West Channels Flood Protection Project

The project, designed to provide flood protection along Sunnyvale East and West channels in the City of Sunnyvale and unincorporated Santa Clara County, is being modified in partnership with Google LLC to improve environment and recreational opportunities. Although the project design was completed, in 2018, Valley Water signed a Memorandum of Understanding (MOU) with Google for a partnership to modify a section of the project that would potentially enhance its biological resources value and recreational opportunities.

The section of the project to be modified is an approximate 1,110 linear foot stretch of the Sunnyvale West Channel where Google is currently planning a campus development project. The project already includes construction of recreational trails under a cost-share agreement with the City of Sunnyvale. Construction is expected to begin Spring 2020, subject to receipt of required regulatory permits.

San Francisquito Creek Celebration

Saratoga Creek upstream of Bollinger Road

In 2018,

over 173

acres of mitigation lands were maintained beyond the regulatory requirements.

Upper Penitencia Creek Project (Coyote Creek to Dorel Drive)

This multi-purpose project in the City of San José is a unique project that is being developed to benefit both people and wildlife, and in a manner that will explicitly incorporate the goals of local partners who own and operate land adjacent to the creek. The project objectives are to provide flood protection, maintain water supply and provide recreational benefits while preserving and enhancing the natural creek habitat and the adjacent existing open space and parkland. Bound by highly urbanized area, the creek provides vital habitat for steelhead as well as other native plant and wildlife species. The planning study report for this Safe, Clean Water Program-funded project is expected to be completed in 2019.

Upper Guadalupe River, Reach 6 Gravel Augmentation Project

In 2011, Valley Water widened a section of the Guadalupe River by constructing a floodplain from I-280 to the South Pacific Railroad crossing (located downstream of Willow Street) to provide flood protection to the adjoining neighborhoods. The section, called Reach 6, is part of the six-mile-long Upper Guadalupe River Flood Protection Project extending from I-280 to Blossom Hill Road.

Valley Water is now returning to the site with plans to enhance the aquatic environment, going beyond the required mitigation for environmental impacts caused during construction of the flood protection project. The habitat enhancement project entails placing 1,100 cubic yards of coarse gravel and cobble in the Reach 6 channel to fill deep pools of stagnant water and create a more natural channel with riffles and gravel bars for migrating Central California Coast steelhead, which is listed as "threatened" under the Endangered Species Act.

The project is expected to be completed in 2019, following which Valley Water biologists will monitor the site for at least three years to determine its effectiveness. If successful, a second phase of aquatic habitat enhancement will be carried out by placing coarse gavels and cobbles in an additional five deep pools in Reach 6.

For more information, visit **https://www.valleywater.org/project-updates/creek-river-projects**.

Valley Water

Clean Water • Healthy Environment • Flood Protection

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